Course: POLI 500 – Social Scientific Thinking I
Term: Fall 2016
Room: Herzstein 126
Class: Friday, 2:00p-5:00p

INSTRUCTOR CONTACT INFORMATION

Instructor: Dr. Justin Esarey
Office: Herzstein 108
Email: justin@justinesarey.com
Office Hours: Tuesday and Wednesday, 2:00p-3:00p

COURSE OBJECTIVES AND LEARNING OUTCOMES

This course introduces students to the basic philosophical problems of applied social science, techniques for achieving accurate causal and explanatory inference, and practical skills for executing a successful research project.

Students will be able to:

1. Understand the scientific method as it applies to social science, including scholarly controversies and potential shortcomings, with a particular emphasis on hypothetico-deductivism and falsificationism.
2. Understand different viewpoints on the use and interpretation of empirical research in political science, including the relationship between theory and empirical research.
3. Understand and critique the Neyman-Rubin and Pearl structural causal modeling frameworks.
4. Understand the strengths and weaknesses of various forms of research designs for empirical social scientific research.
5. Communicate their understanding of these topics by using LaTeX to create written reports.
6. Communicate their understanding of these topics by responding to essay prompts on exams.

REQUIRED TEXTS AND MATERIALS

All course assignments must be typed in LaTeX, but software exists to make this easy to accomplish. I suggest using Sublime Text 2 (http://www.sublimetext.com/2) in combination with MiKTeX on Windows (http://miktex.org/), MacTeX on Macintosh (http://www.tug.org/mactex/) or TeXLive on Linux (http://www.tug.org/texlive/).

All students must have a valid Rice e-mail address and login (and access to the OWL-space website) to participate in this course.

Textbooks:

1. Balashov, Yuri and Alex Rosenberg, eds. 2002. *Philosophy of Science: Contemporary Readings* Routledge: Oxford.
2. Clarke, Kevin and David M. Primo. 2012. *A Model Discipline: Political Science and the Logic of Representations*. Oxford University Press: Oxford.
3. Gerber, Alan S., and Donald P. Green. 2012. *Field Experiments: Design, Analysis, and Interpretation*. W.W. Norton.
4. Graff, Gerald, and Cathy Birkenstein. 2014. *They Say, I Say: The Moves that Matter in Academic Writing, Third Edition.* Norton: New York.
5. King, Gary, Robert O. Keohane, and Sidney Verba. 1994. *Designing Social Inquiry: Scientific Inference in Qualitative Research*. Princeton University Press: Princeton, NJ.
6. Kuhn, Thomas. 1996 [1962]. *The Structure of Scientific Revolutions, Third Edition*. University of Chicago Press: Chicago.
7. Morgan, Stephen L. and Christopher Winship. 2007. *Counterfactuals and Causal Inference: Methods and Principles for Social Research, Second Edition*. Cambridge University Press: Cambridge.
8. Shadish, William R., Thomas D. Cook, and Donald T. Campbell. 2002. *Experimental and Quasi-Experimental Designs for Generalized Causal Inference.* Houghton-Mifflin: Boston.

GRADED ASSIGNMENTS

Grade Components: A student's grade will be assessed in three ways:

- Reaction papers: 50% of the grade
- Midterm exam: 20% of the grade
- Final exam: 20% of the grade
- Class Participation: 10% of the grade

Reaction Papers: Each week, students must submit a 5-7 page (double-spaced) each week. The essays should reflect the assigned readings for that week, and will respond directly to a prompt given by the professor in class the week before the reading assignment is due. Essays are due at the start of the class during which the assigned readings will be discussed.

Exams: Exams will be take home, open book, and open note. However, consulting anyone (including internet message boards, other students in the class, and other students in the program) except the instructor is prohibited. 24 hours will be allotted for completion of the exam.

Class Participation: Students will be randomly called upon by the instructor to answer discussion questions pertaining to the week's readings. The quality of the answers, and other contributions to class discussion, will be assessed as a component of the student's grade.

GRADE POLICIES

Grading Scale:

100%-97%: A+	86.9%-83%: B	69.9%-67%: D+
96.9%-93%: A	82.9%-80%: B-	66.9%-63%: D
92.9%-90%: A-	79.9%-77%: C+	62.9%-60%: D-
89.9%-87%: B+	76.9%-73%: C	>59.5%: F
	72.9%-70%: C-	

Late Work: Assignments are due at the date and time I specify for the assignment. Late reaction papers will be marked off at 5 percentage points for the first 12 hours late (i.e., submitted between 1 minute and 12 hours after the assignment is due), and an additional 10 percentage points for every subsequent 12 hours late. Late exams will be marked off at 5 percentage points for the first 30 minutes late (i.e., submitted between 1 and 30 minutes after the assignment is due) and an additional 10 percentage points for each subsequent 30 minutes late.

ABSENCE POLICIES

Attendance is mandatory in this class, and as graduate students I expect that attendance will not be a problem for you. Every class you fail to attend (without an acceptable excuse—see below) will result in a 2.5 percentage point deduction from your final grade. (I expect that this will never happen.)

Attendance penalties may be waived in the event of death in the immediate family (parent, spouse, sibling, or child) within 2 weeks before the due date, in the event of an unforeseeable medical emergency affecting yourself, your spouse, or your child, or if you are participating in a pre-approved academic activity (e.g., a conference). Penalty waivers are at the discretion of the instructor. I may require supporting documentation.

RICE HONOR CODE

All forms of academic misconduct will be handled according to the Rice University Honor Code. Details on the Honor Code are available at http://honor.rice.edu/honor-system-handbook/.

If you ever have any questions about what you should do to stay within the honor code on a particular assignment, PLEASE contact me with your question and I can assist you. I cannot guarantee a timely response unless you contact me at least 24 hours in advance of the time the assignment is due.

DISABILITY SUPPORT SERVICES

If you have a disability and require accommodation in this class, please contact me as soon as possible (within the first two weeks of class) to discuss these accommodations. You will also need to contact the Disability Support Services Office (telephone extension: 5841) in the Allen Center.

SYLLABUS CHANGE POLICY

The policies of this syllabus (other than absence policies) may be changed by Prof. Esarey with advance notice.

COURSE OUTLINE AND READING ASSIGNMENTS

8/26: How to use LaTeX

1. Download and install:
    a. MiKTeX (for PC: http://miktex.org/) or MacTeX (for OS X: https://tug.org/mactex/)
    b. Sublime Text 2: http://www.sublimetext.com/2

2. Read:
    a. Indian TeX Users Group Tutorial on LaTeX. URL: http://www.tug.org/tutorials/tugindia/

3. Bring your laptop to class.

9/2: APSA Conference (no class)

9/9: Experimentation—the heart of science (117 pages of reading)

1. Gerber, Alan S., and Donald P. Green. 2012. *Field Experiments: Design, Analysis, and Interpretation*. Norton: New York.
    a. Chapter 1, pp. 1-18: "Introduction."
    b. Chapter 2, pp. 21-46: "Causal Inference and Experimentation."

2. Shadish, William R., Thomas D. Cook, and Donald T. Campbell. 2002. *Experimental and Quasi-Experimental Designs for Generalized Causal Inference.* Houghton-Mifflin: Boston.

    a. Chapter 2, pp. 33-63: "Statistical Conclusion Validity and Internal Validity."
    b. Chapter 3, pp. 64-102: "Construct Validity and External Validity."

9/16: Writing for a social scientific audience (149 pages of reading)

1. Graff, Gerald, and Cathy Birkenstein. 2014. *They Say, I Say: The Moves that Matter in Academic Writing, Third Edition.* Norton: New York.
    a. Part 1, pp. 19-54: "They Say"
    b. Part 2, pp. 55-104: "I Say"
    c. Part 3, Chapter 8, pp. 105-120: "As a Result"
    d. Part 3, Chapter 10, pp. 129-138: "The Art of Metacommentary"
    e. Part 4, Chapter 16, pp. 202-220: "The Data Suggest: Writing in the Sciences."
    f. Part 4, Chapter 17, pp. 221-238: "Analyze This: Writing in the Social Sciences."

9/23: The hypothetico-deductive method, falsificationism, and positivism (90 pages of reading)

1. Friedman, Milton. 1953. "The Methodology of Positive Economics." In Friedman, *Essays in Positive Economics*. Chicago University Press: Chicago, IL. pp 3-46.

2. Balashov, Yuri and Alex Rosenberg, eds. *Philosophy of Science: Contemporary Readings.* 2002. Routledge: Oxford.

    a. Chapter 3, pp. 45-55: "Two Models of Scientific Explanation" by Carl Hempel.
    b. Chapter 16, pp. 289-294: "On Induction" by Bertrand Russell.
    c. Chapter 17, pp. 294-301: "Science: Conjectures and Refutations" by Karl Popper.
    d. Chapter 22, pp. 340-361: "Two Dogmas of Empiricism" by W.V.O. Quine.

9/30: Normal science and paradigm shifts (112 pages of reading)

1. Kuhn, Thomas. 1996 [1962]. *The Structure of Scientific Revolutions, Third Edition*. University of Chicago Press: Chicago.

    a. Chapters 1-10, pp. 1-111.

10/7: The link between theory and empirical work in political science (181 pages of reading)

1. Clarke, Kevin and David M. Primo. 2012. *A Model Discipline: Political Science and the Logic of Representations*. Oxford University Press: Oxford. 220 pp.

10/14: Explanation and prediction as goals of empirical work (61 pages of reading)

1. Breiman, Leo. 2001. "Statistical Modeling: The Two Cultures." *Statistical Science* 16(3): 199-231.

2. Shmueli, Galit. 2010. "To Explain or to Predict?" *Statistical Science* 25(3): 289-310.

3. Stevens, Jacqueline. 2012. "Political Scientists are Lousy Forecasters." *New York Times*, Sunday June 26th, 2012. URL: http://goo.gl/Iiq03L.

4. Dickinson, Matthew. 2012. "No, Political Scientists are NOT Lousy Forecasters – In fact, they are Pretty Good." *Presidential Power: A Nonpartisan Analysis of Presidential Politics*, June 26th, 2012. URL: http://goo.gl/8O8j3N.

5. Henry Farrell. June 24, 2012. "Why the Stevens Op-Ed is Wrong." The Monkey Cage. URL: http://themonkeycage.org/blog/2012/06/24/why-the-stevens-op-ed-is-wrong/.

************ CUTOFF FOR EXAM 1 MATERIAL ************

10/21: Causality and inference: The Neyman-Rubin model (129 pages of reading)

1. Morgan, Stephen L. and Christopher Winship. 2007. *Counterfactuals and Causal Inference: Methods and Principles for Social Research, Second Edition.* Cambridge University Press: Cambridge.
    a. Chapter 1, pp. 3-34: "Introduction."
    b. Chapter 2, pp. 37-76: "The Counterfactual Model."

2. Sekhon, Jasjeet S. 2008. "The Neyman-Rubin Model of Causal Inference and Estimation via Matching Methods." Chapter 11 in Box-Steffensmeier et al., *eds.*, *The Oxford Handbook of Political Methodology*. Oxford University Press: Oxford. pp. 271-299.

3. Applied reading: Arceneaux, Kevin, Alan S. Gerber, and Donald P. Green. 2006. "Comparing Experimental and Matching Methods Using a Large-Scale Voter Mobilization Experiment." *Political Analysis* 14: 37-62.

10/28: Causality and inference: the Pearl structural model (66 pages of reading)

1. Morgan, Stephen L. and Christopher Winship. 2007. *Counterfactuals and Causal Inference: Methods and Principles for Social Research, Second Edition.* Cambridge University Press: Cambridge.
    a. Chapter 3, pp. 77-95: "Causal Graphs."
    b. Chapter 4, pp. 105-130: "Models of Causal Exposure and Identification Criteria for Conditioning Estimators."

2. Applied reading: Druckman, James N., and Thomas J. Leeper. 2012. "Learning More from Political Communication Experiments: Pretreatment and its Effects." *American Journal of Political Science* 56(4): 875-896.

11/4: Robustness and replicability in published research (53 pages of reading)

1. Ioannidis, John. 2005. "Why most published research findings are false." *PLoS Medicine* 2(8): 696-701.

2. Ioannidis, John. 2008. "Why most discovered true associations are inflated." *Epidemiology* 19: 640-648.

3. Simmons, Joseph P., Leif D. Nelson, and Uri Simonsohn. 2011. "False-Positive Psychology: Undisclosed Flexibility in Data Collection and Analysis Allows Presenting Anything as Significant." *Psychological Science* 22(11): 1359-66. URL: http://www.ncbi.nlm.nih.gov/pubmed/22006061.

4. Elman, Colin, and Arthur Lupia. 2014. "Data Access and Research Transparency (DA-RT): A Joint Statement by Political Science Journal Editors." URL: http://goo.gl/SuhQuA.

5. Isaac, Jeffrey C. "For a More *Public* Political Science." *Perspectives on Politics* 13(2): 269-283.

6. Applied reading: Gerber, Alan, and Neil Malhotra. 2008. "Do Statistical Reporting Standards Affect What is Published? Publication Bias in Two Leading Political Science Journals." *Quarterly Journal of Political Science* 3(3): 313-326.

11/11: The peer review process (63 pages of reading)

1. Miller, Beth, Jon Pevehouse, Ron Rogowski, Dustin Tingley, and Rick Wilson. 2013. "How To Be a Peer Reviewer: A Guide for Recent and Soon-to-Be PhDs." *PS: Political Science & Politics* 46(1): 120–23.

2. Esarey, Justin. "Does Peer Review Identify the Best Papers? A Simulation Study of Editors, Reviewers, and the Scientific Publication Process." Invited to revise and resubmit at *PS: Political Science and Politics.* URL: http://jee3.web.rice.edu/peer-review.pdf

3. Bornmann, Lutz, Rudiger Mutz, and Hans-Dieter Daniel. 2010. "A Reliability-Generalization Study of Journal Peer Reviews: A Multilevel Meta-Analysis of Inter-Rater Reliability and Its Determinants." *PLoS One* 5(12): e14331. URL: http://dx.doi.org/10.1371/journal.pone.0014331.

4. *The Political Methodologist* Special Issue on Peer Review (Fall 2015), pp. 2-24. URL: https://goo.gl/3kfa3e.

    a. Esarey, Justin. "Introduction to the Special Issue / Acceptance Rates and the Aesthetics of Peer Review."
    b. Nyhan, Brendan. "A Checklist Manifesto for Peer Review."
    c. Friere, Danilo. "Peering at Open Peer Review."
    d. Leeper, Thomas J. "The Multiple Routes to Credibility."
    e. Pepinsky, Thomas: "What is Peer Review For? Why Referees are not the Disciplinary Police."
    f. McLaughlin Mitchell, Sara: "An Editor's Thoughts on the Peer Review Process."
    g. Krupnikov, Yanna, and Adam Seth Levine. "Offering (Constructive) Criticism When Reviewing (Experimental) Research."

5. Applied Reading: Crabtree, Charles, and Matt Golder. 2016. "Response to Powell and Tucker's 'Little is Known about Party System Volatility in Post-Communist Europe, but We have Interesting New Methods and Data for Studying It.'" *British Journal of Political Science* (forthcoming). URL: http://goo.gl/WzUeuP.

11/18: Barriers to inference in (observational) research: selection bias, inefficiency, omitted variable bias, and endogeneity (137 pages of reading)

1. King, Gary, Robert O. Keohane, and Sidney Verba. 1994. *Designing Social Inquiry: Scientific Inference in Qualitative Research*. Princeton University Press: Princeton, NJ.

    a. Chapter 4, pp. 115-149: "Determining What to Observe."
    b. Chapter 5, pp. 150-207: "Understanding What to Avoid."

2. Clarke, Kevin. 2005. "The Phantom Menace: Omitted Variable Bias in Econometric Research." *Conflict Management and Peace Science* 22: 341-352.

3. Geddes, Barbara. 1990. "How the Cases You Choose Affect the Answers the Answers You Get: Selection Bias in Comparative Politics." *Political Analysis* 2: 131-150.

4. Applied reading: von Stein, Jana. 2005. "Do Treaties Constrain or Screen? Selection Bias and Treaty Compliance." *American Political Science Review* 99(4): 611-622.

11/25: Thanksgiving Recess (no class)

12/2: Observational research designs (153 pages of reading)

1. Angrist, Joshua D. and Jorn-Steffen Pischke. 2010. "The Credibility Revolution in Empirical Economics: How Better Research Design is Taking the Con out of Econometrics." *Journal of Economic Perspectives* 24(2): 3-30.

2. Angrist, Joshua D. and Alan B. Krueger. 2001. "Instrumental Variables and the Search for Identification: From Supply and Demand to Natural Experiments." *The Journal of Economic Perspectives* 15(4): 69-85.

3. Lee, David S., and Thomas Lemieux. 2010. "Regression Discontinuity Designs in Economics." *Journal of Economic Literature* 48(2): 281-355.

4. Applied reading: Acemoglu, Daron, Simon Johnson, and James A. Robinson. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation." *The American Economic Review* 91(5): 1369-1401. URL: http://goo.gl/57CUYJ.